

On this factor, then, of coloration, characteristic of their downy chicks, and on this factor alone—if no others were available—it appears to me that the species of the group of Ringed-Plovers which we have been discussing, stand apart and are worthy of generic consideration.

“Without juggling with facts,” we can easily recognise in it a very natural and compact group of Plovers, which is well differentiated in a variety of ways from any other group of true Plovers; and to lump it with these last—a very heterogeneous collection—seems to me to be not only quite an unscientific procedure but one which is devoid of any practical utility. It is surely a movement backwards towards the dark ages of our ornithological ignorance.

Finally, I should like to call attention to the much neglected study of the downy nestlings of the whole group of Waders—to say nothing of other groups. From the point of view of the phylogenetic relationships of the whole suborder of the Limicolæ, I am convinced that attention to this branch of study would be of the greatest possible service in reducing order out of what at present can only be called chaos; and on this point I hope to be able to offer some further observations in the near future.

XXIII.—*Notes on Molina's Pelican (Pelecanus thagus).*

By HENRY O. FORBES, LL.D., M.B.O.U.

(Plate XIII. *)

HAVING been commissioned by the Peruvian Government to investigate certain questions relating to the birds inhabiting the Guano Islands of the Republic, I had opportunities of observing many of the species, chiefly marine, under unusually favourable circumstances, for a period of some eighteen months during 1912 and 1913. These islands extend at intervals along the coast of Peru between 6° 30' and 17° 0' South latitude, and are none of them situated more than a score of miles from the mainland. They are

* For explanation of the plate see p. 420.

all absolutely desert, and devoid of human inhabitants except at the guano-collecting season. Of the birds frequenting them the most important from an economic point of view are Molina's Pelican, Bougainville's Cormorant (*Phalacrocorax bougainvillii*), and two species of Gannet (*Sula variegata* and *S. nebouxii*). Their numbers are almost incredible, and these four species together cannot fall far, if any, short of one hundred millions. Each bird consumes at least ten pounds of fish daily, that is, they wrest from the sea a daily harvest of close on half a million tons of various kinds of its piscine inhabitants.

In studying Molina's Pelican—whose range is confined to the Pacific Coast of South America from about 3° 30' to 37° 0' S. lat.—I was at first much perplexed by the great variation presented by the colours of the irides, of the soft parts, and of the plumage of the neck and body. I could find little or no information in the various works I consulted to guide me in deciding whether these differently marked birds belonged to separate species or were only seasonal changes of the same species, and if the latter, in what order the various garbs succeeded each other and at what ages they were assumed. Under these circumstances, therefore, I have thought it may prove useful to place on record the following notes, recorded in the flesh, of the soft or fadable parts in the specimens I obtained.

The numbers which preface each record are those attached to the individual specimens in my collection, and the observations are copied from my daily journal written at the time. These specimens are all either in the British Museum (Natural History) or the Zoological Museum at Tring. I am still unable to make up my mind what is the exact plumage sequence, or how long each dress is retained; but with the assistance of the present notes, which refer to specimens collected in every month of the year except July and November, other ornithologists in Peru, who have the opportunity, especially my late private secretary and energetic assistant, who has now been appointed Warden of the islands, Señor Don Herbert Tweddle, may, I hope, be induced to make and publish further observations on the subject.

*Description of the colours of the soft parts of
examples of Pelecanus thagus.*

No. 25. ♀.

Irides bluish black with pale yellowish outer ring. Upper mandible: culmen greenish blue; hook corneous, lateral bar yellow approaching orange. Lower mandible: ramus greenish blue, dorsal edge yellow. Pouch: ground-colour bluish with striations parallel to mandible of a deeper blue alternating with purplish red, its lower portion orange without the blue lines. Legs and feet lemon-green.

Neck black, no white along the edge of the pouch; breast pure white.

N. Chincha I., 16. 2. 12.

No. 39. ♀.

Irides dark brown; bare skin in front of eyes to nostril lavender-blue. Upper mandible: culmen and lateral bar yellow, corneous scales at base; culmen anteriorly corneous with lake lines through it; hook rich yellow; lateral bar anteriorly lake-red becoming rich orange at tip. Lower mandible: skin at base lavender-blue; rami with yellow corneous scales, passing into orange-red, and terminal hook orange. Gular pouch pale lavender-blue with pale lines along it parallel to lower mandible as far down as level of occiput; its lower portion very velvety sooty black without pale lines; very pale lavender patch parallel to neck and separated from the feathers by a black line.

N. Chincha I., 21. 2. 12.

No. 46. ♂.

Irides pale grey. Pouch: uniform greenish blue with dark blue margin underneath, parallel to the lower mandible. Legs and feet pale greenish blue.

Chincha Islands, 26. 2. 12.

No. 89. ♂.

Died in captivity.

Entire neck black; a few white tips to the feathers of the forehead.

Central Chincha I., 6. 3. 12.

No. 93. (Sex ?)

Irides rich greyish brown. Upper mandible: culmen pale green, tip orange; ventral margin rich rose colour. Lower mandible: purple dotted with yellow at base, then entirely yellow on the margins, merging into purplish rose, and tip rich orange. Pouch: striations parallel to the lower mandible and as low as the first vertebra, purple, becoming rich yellow, with the striations finer, about three-quarters of the way down; below level of first vertebra the striations, which become parallel to the neck, are also purple. In front of eye, and under it, the bare skin is pale blue.

Head and neck black.

Ancon, 21. 4. 12.

No. 149. ♂, no. 150. ♀, no. 151. ♀.

Irides dark brown with outer ring of pale yellow; skin between eye and beak pale lavender. Upper mandible: culmen greenish at base, becoming a pale yellow and having corneous scales anteriorly; hook orange; lateral bar with greenish scales at base, then lake-red, becoming orange under the hook. Lower mandible: posterior third with chalky corneous scales, bare skin at base lavender; ramus yellowish green with lavender-blue showing through at spots midway, purple merging into orange-red at the anterior end; dorsal margin lake-red extending further back than the purple, tip orange. Gular pouch: lines parallel to mandible, purple on yellowish under-colour; below level of occiput and parallel to neck the lines are grey on a black background.

Lobos de Tierra I., 21. 5. 12.

No. 154. ♀.

Agrees with above but varies in colour of the gular pouch which, parallel to the mandible, is striated with lavender-blue lines; coalescing and diverging narrow and broad bars upon background of pale yellow, becoming brighter anteriorly; parallel to throat the pouch is greyish yellow with reddish-brown lines. Legs and feet isabelline-yellow.

Breast pure white; head speckled with black.

Lobos de Tierra I., 24. 5. 12.

No. 180. ♀.

Irides brown with yellowish-grey outer ring. Upper mandible: culmen with corneous chalky scales and yellow under-colour; hook rich orange; lateral bar with bare skin at base lavender and with corneous yellow scales, becoming rich lake anteriorly, deeper towards tip. Lower mandible: skin at base lavender, with corneous orange scales on ramus, becoming orange-lake on dorsal and orange on ventral margin, tip rich orange. Gular pouch: has a sooty line separating ramus from pouch, in region beneath the mandible a greenish-grey basal colour with pale lavender lines parallel to the mandible; lower part of sac yellow and behind larynx grey, with indistinct yellow bar. Breast spotted.

Lobos de Tierra I., 1. 6. 12.

No. 181. ♀.

Irides brown with yellowish-grey outer ring. Upper mandible: culmen with corneous chalky scales and yellow under-colour; hook rich orange; lateral bar with bare skin lavender at base and with corneous yellow scales becoming rich lake anteriorly, deeper towards tip. Lower mandible: skin at base lavender, with corneous orange scales on ramus, becoming orange-lake on dorsal margin, orange on ventral margin, tip rich orange. Gular pouch, separated from mandible by a dark sooty bar, has in region parallel to mandible a basal colour of greenish grey lined with pale lavender; lower part of sac sooty barred with faintest yellow lines. Legs and feet greenish yellow, soles of feet greenish lavender.

Lobos de Tierra I., 1. 6. 12.

No. 223. ♀, no. 225. ♀.

Irides umber-brown; bare skin in front of eyes dark lavender. Upper mandible: culmen yellowish blue becoming purple towards the hook, which is dark orange; lateral bar, deep blue at base, where skin-covered; ramus covered with yellow chalky corneous scales for half its length, rest lake, longitudinal line bordering culmen green. Lower mandible: skin at base dark lavender; ramus bluish

green, with patches of yellow chalky corneous scales, anterior two-thirds lake along the dorsal margin, centrally isabelline yellow, hook dark yellowish corneous. Gular sac: broad sooty bar underneath ramus for about half its length, below which for entire length of mandible a dark sooty-grey area with parallel lavender lines, bars and blotches; below this grey area and down to feathered region a sooty area with yellowish patches and lines; and parallel to neck, sooty lines; a patch of very delicate lavender, lined longitudinally with yellow, borders the white feather-streak on the neck. Legs and feet dark dull lavender-blue.

Lobos de Tierra I., 23. 6. 12.

No. 224. ♀.

Irides umber-brown; bare skin round, below, and behind the eye, dark purplish lavender. Upper mandible: culmen with a narrow line of blue at base, remainder rich bluish green; hook faded yellow; warty blue line from division between culmen and lateral bar for about an inch toward eye; skin at base of lateral bar purplish lavender, anteriorly greenish yellow with whitish-yellow corneous scales, remainder deep lake to tip, hook deep orange. Lower mandible: bare skin at base deep purplish lavender, anteriorly yellowish green; basal one-third of dorsal margin orange, rich lake to tip; centrally, for half its length, orange-lake, merging into lake. Gular pouch as in nos. 223 and 225.

Lobos de Tierra I., 23. 6. 12.

No. 226. ♀. (Plate XIII. fig. 3.)

Irides umber-brown; bare skin around eye lavender. Upper mandible: culmen with yellowish-white corneous scales, remainder yellowish green, hook yellow; warty line between bases of culmen and lateral bar pale lavender, base of lateral bar pale lavender, anteriorly scaly and whitish yellow, remainder lake. Lower mandible: base with corneous scales, dark green. Gular pouch with sooty bar beneath mandibular ramus and from its base for about half its length; lines and bars parallel to mandible lavender upon a dark sooty-purple background; those parallel to throat very

indistinct yellowish upon a sooty-grey background; bar parallel to the white feather-streak, along the neck, purplish pink with paler reticulations. Legs and feet dark dull lavender-blue.

Crest with uppermost feathers white and lower black with white points; lower chest striped, abdomen and sides of body less so.

Lobos de Tierra I., 23. 6. 12.

No. 269. ♀.

Irides black. Bare skin round eyes lavender, that between the eyes and the upper mandible both above and below the orbits presenting jet-black carunculations on a lavender background. Upper mandible: culmen greenish orange with incrustations of flaky corneous tissue; and just before rising on to the hook, it becomes white-streaked with black parallel lines; hook rich orange; lateral bar pale greenish yellow at base and along its dorsal margin, the remainder of the bar lake-red, deeper near the hook, and presenting thick flaky corneous incrustations posteriorly. Lower mandible: posteriorly lavender, centrally rich orange and deep orange lake-red, tip of its hook yellow. Pouch: having below the mandible very deep lavender-purple bars parallel to the mandible; below larynx, and posterior to mandible, sooty black; base of pouch sooty grey, continuing also along the base of the anterior part; widish lavender patch parallel to the neck along the posterior edge of pouch. Inside of mouth deep sea-green with orange lines on the palatal ridges, becoming rich lavender at entrance to the throat. Inside of pouch pale lavender. Legs and feet pale lavender.

Ancon, 16 9. 12.

No. 282. ♀.

Irides rich brown with outer ring of pale yellowish grey, skin around eye pale flesh-colour, that in front of eye and at base of mandible pale lavender with carunculations of same colour between the eyes and nostrils. Upper mandible: culmen with corneous scales greenish yellow; hook orange-yellow; lateral bar like culmen to about half its length,

when it becomes orange-red on ventral margin. Lower mandible : skin at base pale lavender ; ramus orange-yellow, anterior third orange-lake scarlet. Gular pouch : bars parallel to ramus and nearer to it purple-grey, the rest brownish grey on a pale lavender background ; below level of occiput the bars disappear and the pouch is uniform greyish brown ; a broad purple streak runs parallel to neck alongside the feathers. Legs and feet lavender with slight tinge of green on metatarsus.

Neck grey behind.

Ancon, 19. 9. 12.

No. 285. ♀.

Colours of head, neck, and pouch exactly as in no. 269.

The head pale lemon-yellow, as also some of the crest-feathers ; the lemon-yellow traverses each side of the neck passing down to meet in front of the chest, leaving a white or less yellow area immediately below the pouch. Abdomen spotted. Legs and feet dirty lavender.

Ancon, 22. 9. 12.

No. 338. ♀. (Plate XIII. fig. 1.)

Irides straw colour ; skin round eye pink or carmine-pink ; carunculations black and large between orbit and beak, but smaller on the bare skin at posterior end of both mandibles ; under the orbit and between it and the upper mandible they are fewer and the skin is bluish purple. Upper mandible : culmen chalky white, hook pale orange with a black spot in posterior convexity of the hook ; lateral bar yellowish chalky for one-fifth its length, then carmine-red, merging into carmine-orange towards the tip. Lower mandible orange chalky, then orange-carmine. Pouch : sooty black, the light bars parallel to the lower mandible rich pale bluish lavender, the lower ones somewhat paler ; the bars parallel to the neck are rich bluish lavender. Legs and feet dirty greenish blue.

Top of head pale yellow, which runs down the sides of the sooty-black pouch to meet beneath it, where it becomes paler. Neck pure white.



1.



3.



2.



4.

Stomach contained 3 fishes (2 Cabinsa and 1 Micho) weighing 1 lb. in weight.

Ofrenda Bay, near Ancon, 21. 10. 12.

No. 459. ♂. (Plate XIII. fig. 2.)

Irides pale grey; black carunculations at base of culmen, lateral bar, and lower mandible. Upper mandible: culmen yellowish-horn colour with dark mark posterior to hook; hook corneous yellow; lateral bar pale corneous, anterior third orange-red. Lower mandible bright yellowish white with chalky corneous scales, anteriorly orange-red; hook orange. Gular pouch with longitudinal patch of black under ramus, from angle of lower mandible forward having white and lavender lines parallel to ramus, deeper anteriorly and along raphe beneath, remainder of pouch deep black; parallel to throat and bordering the feathers several orange lines succeeded by others of lavender colour. Legs and feet dusky lavender.

An incubating bird.

Mid-Chincha I., 29. 12. 12.

No. 460. ♂.

Irides pale grey; no carunculations; otherwise similar to no. 459, except that the lines on the transverse portion of the pouch are deeper lavender and intercalated with others very dark blue, almost black; the middle line along its base sooty black. The vertical portion of pouch, parallel to the neck, sooty black. Legs and feet dusky lavender.

Top of head white: no crest; breast and abdomen fully striped. An incubating bird.

Mid-Chincha I., 29. 12. 12.

No. 474. ♂, no. 475. ♂ (Plate XIII. fig. 4), no. 476. ♂.

Irides greyish white; carunculations black. Upper mandible: bare skin at base black; posteriorly yellowish-horn colour with some corneous scales, anteriorly rich lake. Lower mandible with bare skin at base black, posteriorly rich orange, anteriorly rich orange-lake. Gular pouch:

lines on the transverse portion rich lavender ; those on the posterior aspect of the vertical portion rich cream-colour alternating with others bluish white, remainder of pouch velvety blue-black.

N. Chincha I., 2. 1. 13.

No. 501. ♂.

Irides yellowish brown ; bare skin in front of eye bluish purple. Upper mandible : culmen dark lavender, lateral bar lighter lavender posteriorly, anteriorly including hook pale yellow. Lower mandible : bare skin at base and posterior portion of ramus bluish purple, anteriorly pale yellow. Gular pouch pale cream-colour, with a streak of lavender underneath the mandible, and a deeper bar close and parallel to the feathered area of neck. Legs and feet white.

Canevaro Peninsula, Lobos de Tierra I., 22. 2. 13.

No. 502. ♂.

Irides purplish grey with outer lighter ring ; otherwise the same as 501, except that the yellow in that is replaced in this by orange.

Canevaro Peninsula, Lobos de Tierra I., 22. 2. 13.

No. 503. ♂.

Irides greyish yellow ; otherwise as in 501, except that the culmen is darker corneous.

Stomach contained 1 lb. 15¼ oz. of anchovitas (*Engraulis ringens*).

Canevaro Peninsula, Lobos de Tierra I., 22. 2. 13.

No. 519. ♀.

Irides light yellow ; bare skin around face and base of upper mandible pale lavender. Upper mandible : culmen dark corneous with anterior third isabelline yellow ; hook orange. Lower mandible entirely pale lavender. Gular pouch rich cream-colour with 'shagreened' surface on the lines and bars of pale lavender which traverse it. Legs and feet horny white, toes lavender.

Canevaro Peninsula, Lobos de Tierra I., 2.3.13.

No. 520. ♂.

Irides pale straw colour, otherwise the same as 519, except that the anterior portion of beak (not including the culmen) is pale green.

Canevaro Peninsula, Lobos de Tierra I., 2. 3. 13.

Molina, "one of the most pernicious blunderers who have brought confusion into natural history," as he has been described by a distinguished English botanist, was the first to introduce this Pelican to science as a new species in 1786*, and he certainly made no pernicious blunder in his determination. *Pelecanus thagus* is an excellent species. The bird was for centuries prior to that date familiar to, and held in respect by, the Incas. On many of their ancient textiles it is represented devouring a fish, and Sir Clements Markham refers to Mr. Spence's description of "a series of plates, almost like a lady's muslin collar in size and shape, covered with figures. On one of these there were nearly a hundred figures of pelicans. Every figure represents the bird in a different attitude, and as they have been stamped, not engraved, a separate die must have been used for each figure."

Pelecanus thagus is met with along the whole coast of Peru at all periods of the year. It occurs also at certain seasons in the Guayaquil River, in Ecuador, where, I am informed, it may be seen roosting on the trees of that richly forested region, and as far south as Lota, in Chile, in 37° S. lat. So far as I was able to ascertain, however, it does not migrate, nor does it breed in either the northern or the southern extremes of its range. Fortunately for the Republic of Peru, it prefers to nest in the desert and arid islands owned by it, and but very occasionally on the sandy coast pampas of the mainland far from human habitations.

In January 1912, when I first visited the Chincha group of islands, lying between 13° and 14° S. latitude, I was witness to a very remarkable episode in the history of this (and some other) species of guano birds. I found there the

* Molina, Hist. Nat. Chili, 1786, p. 212.

whole of the breeding plateaux of the different islands dotted thick with nests of Pelicans and Cormorants, the vast majority of them still containing nestlings of different ages—to the number of some millions—but all of them dead, sun-baked mummies. It appeared that in the previous November, almost the entire avian population of the islands began suddenly, for some reason, so far not yet satisfactorily explained, to take their departure, leaving both eggs and young to their fate : some to die of hunger, others to be devoured, till disgust intervened upon satiety, by the Vultures, the Gulls, and the Terns. By December, 1911, hardly a score of birds remained, as was the case when I arrived in January, 1912 ; and none returned to nest till the end of that year. What took place at the Chincha Islands, occurred at almost every other breeding-station throughout the length of the Republic—a coast-line of nearly 1000 miles.

The Chincha and the Lobos groups contain perhaps the largest pelicaneries in Peru ; but smaller colonies breed in almost all the islands. As early as June the ovaries of the females had begun to enlarge against the incubating season, which occurs in the spring of the southern hemisphere. By October, the pairing—which appears to be unobtrusive—has been accomplished, and the assembling together of the multitudinous couples in the usual nesting area on the pampa of the islands is in progress. At the Chinchas I found the nests of Molina's Pelican to begin as little more than hollow depressions, circumvallated with dry guano and dry sand, which latter the birds industriously scrape from the ground wherever it can be found, and loading it into their gular pouch, carry it laboriously to the chosen spot. Such feathers as can be picked up or stolen from their own kin or from the Cormorants are used as a lining. Later, each nest assumes much greater proportions through the uniform deposit around it of fresh guano from day to day, first by the parents and afterwards by them and the young conjointly.

The birds were busy nest-building about the beginning of

November, and towards the middle of the month I found eggs under most of them, but only a few had the full clutch of four. These are white in colour with a very chalky surface. Their size averages 83.7×55.7 mm.

Molina's Pelican sits crowded together in large colonies, very generally quite surrounded by still denser and more extensive colonies of *Phalacrocorax bougainvillii*. At this season the birds are extremely timid, and rarely allow the near approach of an intruder without taking wing with a recriminating "wauk," from their nest; in this respect they are unlike their incubating friendly neighbours, the Cormorants, which allow one to come comparatively close to them without leaving the nest. The flight of a parent Pelican from its nest is attended with disastrous results, for the Dominican Gulls and the Gallinazas (*Cathartes aura*), which are eternally on the watch, descend in an avalanche on the unprotected eggs or squabs, and before one can fully realize what is happening, the fond hopes of the parents are irretrievably dissipated.

The "klokken" birds occupy their patient hours of incubation in preening their feathers, ridding them of the very annoying *Mallophaga* with which they are infested. They have also a curious habit of every now and then elevating their beaks perpendicularly in the air, sometimes for the luxury of a cavernous yawn, sometimes to clapper their mandibles, while they vibrate nervously, like a loose sail, the flabby sides of their gular pouch. This Pelican's mature plumage is apparently not acquired before it attains the age of three, perhaps of four years. It would require a series of observations extending over half-a-dozen consecutive seasons to determine with certainty this interesting point. At all events, I am able to affirm that among the birds actually incubating on the Chincha Islands in November 1912 there were individuals in three quite different attires. The majority had the hind neck jet-black, while in others it was sooty grey and in a small number pure white.

Young birds began emerging from the egg towards the end of December. They are hatched in an absolutely

callow condition, and are of a pale flesh-colour, thus differing markedly from those of the Brown Pelican (*P. fuscus*) which, according to Chapman, are livid black. Within a fortnight they are completely endowed with a short fine white down, which remains their garb for a period which I was unable to determine exactly. Their black feathers begin to appear on the wings, dorsum, and tail, a condition in which the nestlings are encountered wandering from their cradle, when they appear, if viewed from a little distance, to be pure white birds with black alar quills and a very conspicuous black cordate spot in the middle of the back. At this stage their irides are extraordinarily variable: no two are quite alike in this respect. The iris in youth would seem to be of a lighter or darker shade of yellow, and at a more advanced age it varies from grey to very dark brown.—The above-mentioned black and white phase was the garb in which I found the immature Pelicans when I reached the Lobos group (6° 30' S. lat.) in February 1913. The young birds had then all vacated the nesting area and had waddled their way over very uneven ground to the little beaches and rocks by the sea-margin on which they pattered about the livelong day, on the alert for the return of their parents from the sea with supplies. When I left the islands in the middle of March, they were still little changed in plumage, and were still being fed by their parents in the extraordinary manner which, as is well known, the Steganopodes practise. Well known as it is, it is always most interesting to a naturalist to be spectator of these curious habits, for the first time especially. The young ones, often two or three at once, sometimes all own brothers and sisters, sometimes in part or even all of them neighbours and aliens in blood, insert their entire head into the gaping mouth of the returned food-bringer, which has to prostrate itself on its belly to allow the freest access to her (or his) capacious store-chamber. The young birds hold very lightly to their repast, for on the slightest alarm they eject it in order to lighten their bodies for escape, which, as they cannot fly, can only be at a goose-step pace. The wonderful ease with which

they can perform this ejaculatory operation is taken advantage of not only by the Gulls and Terns, which mercilessly bully the hapless and helpless innocents, and so fare sumptuously during the season of these birds' infancy, but by the fishermen in need of bait, who, taking a lesson from the sea-fowls, waylay the old birds on their arrival at dusk and, by scaring them, often secure from a single individual the best part of a bucketful. I have been told that 8 lbs. of fish is not an uncommon quantity to be ejected by a bird that has been out on only a short fishing excursion.

At what age and in what plumage the young Pelicans fare forth to the sea "on their own," I am unable to state from personal observation. It seems probable that they do not take to the water till some time after they are able to fly. It seems also that the white down stage is replaced by pure white feathers on the head and neck, in association with a pure white under-surface. The youngest flying birds, or what seem to be so, which I examined were in this plumage. In the next stage, assumed probably the year following their birth, or even the year after that, the white neck is replaced by a sooty-grey one and a partially striped under-surface; and this garb again, but at what age I am unable to state, by the deep black hind neck with a white margin to the yellow-bordered gular sac, and a fully-striped abdominal region; this cannot be assumed before the bird's third year at earliest, but it may be donned later. The specimen (No. 475, Pl. XIII. fig. 4), which I consider to be in fullest nuptial plumage, does not possess so fully-developed a crest, nor has it the same amount of yellow on the neck as one (No. 459, Pl. XIII. fig. 2) which seems to me to be a younger bird, though both were captured during the same incubation period and on the same nesting area. The accompanying plate represents the head and neck of four individuals in the order of what I believe to be their ages.

In April and May the parents certainly, and doubtless many of the young, disperse widely along the coast, although the islands are at no time anything like denuded of Pelicans. They frequent the shores of this stormless

region and are to be seen riding sedately, and less timidly than when on their nests, in the smooth water just outside the line of breakers, feeding on the life to be obtained on the bottom within reach of the point of their long mandibles. In searching for its food on the wing, Molina's Pelican flies heavily and slowly with its head as much to wind as possible, at about forty to fifty feet above the water, throbbing its tail and treading the air with its legs. At the end of its beat, it wheels about quickly, descends the wind and again returns, plodding slowly up against the breeze. On sighting its quarry, the bird suddenly drops its head perpendicularly seaward, as if it were fixing its prey with its eyes; it "backs water" and simultaneously descends through the air by a few rapid strokes of its wings and plunges headlong, or falls as it appears to the observer, into the water, striking it awkwardly and with a heavy splash, almost turning a somersault, which it would execute, where the water is deep enough, I believe, were it not for its wings arresting its submersion, for this species at any rate does not fold them against its chest like the Gannets, but cuts the water when they are still half extended; and it very rarely immerses itself entirely as the European species does. When it has secured its prey, the Pelican rights itself on the water, but has generally to delay several minutes in properly disposing of the contents of its gular pouch before taking wing again. Its manœuvres, after a rather successful haul out of a dense shoal of anchovitas, when sometimes it captures enough to weigh down its pouch for a foot to a foot and a half, are ungainly. It tosses aloft its huge beak fully agape, shaking its head from side to side to tumble its contents throatwards. To get them properly arranged seems always an awkward and difficult task, and it has often to discharge the whole bagful out on the sea again and re-pick them up, or at least what, if it does not look very lively, the "Modest" (*Larus modestus*) and the Dominican (*L. dominicanus*) Gulls—those expert and accomplished sea-roving marauders—leave it, and they rarely miss a chance. One often wonders whether the Pelican would not be better off without such

mandibular and gular organs as it possesses. In comparison with the nimble, acrobatic, and splendidly adapted Gannet, the Pelican appears a clumsy bird. Its aerial displays, however, by their grace and achievement, recover for it any prestige lost in the ungainly manner of its feeding. Molina's Pelican will often—if not habitually—continue its aerial search for food till so long after dusk that it is difficult to follow its movements, diving five or six times in as many minutes and rarely being unsuccessful. After they have at last roosted—and the decision where they can spend the night most comfortably takes a long time to arrive at, for they will try half-a-dozen spots before settling finally—they will frequently, on either observing a commotion of the sea surface, or catching some signal understood of them that a shoal of fish is in the vicinity, hurriedly sally out again in a throng and vigorously fall upon it. Their great bodies, magnified in the half-light, against the long-lasting clear belt of light athwart the western horizon, look like so many untidy sacks hurtling through the air into the sea. When at last "Little Mary" reports that sufficient has been laid in against the night, the birds flap their majestic way home again, in long files; or they may change their mind, and bear away to some distant island or rock to spend the night free from "alarums," or danger to their repletion.

Molina's Pelican is a good bit of a sneak also. Often it may be seen buoyantly riding, apparently asleep, on the water near the shore, till perhaps a "Cuervo de Mar" (*Phalacrocorax vigua*) unexpectedly pops up within sight of it, from under the surface, with a captured eel in its beak. The "alcatraz" is instantly alert, and by the "crow's" side in a few moments, and if the latter has not got a completely manageable hold—often the case—on its slippery prey, the former will snatch it from its neighbour's mouth and dispose of it instantly and comfortably in its capacious carpet-bag. By such mean manners the Pelican obtains quite a deal of its supplies—or at least a considerable unearned increment to them.

After all, Molina's Pelican is a splendid and attractive

bird whose disappearance, if civilization and cultivation should eventually ruthlessly cause its extinction, would be a lamentable loss to ornithology.

EXPLANATION OF PLATE XIII.

Heads of *Pelecanus thagus*.

- Fig. 1. Female, Ofrenda Bay, Arcon. 21. x. 12.
 Fig. 2. Male from Mid-Chincha Island. 29. xii. 12.
 Fig. 3. Female from Lobos de Tierra Island. 23. vi. 12.
 Fig. 4. Male from North Chincha Island. 2. i. 13.
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XXIV.—*On a Peculiarity in the Nest of the Tasmanian Tit* (*Acanthiza diemenensis*). By H. STUART DOVE, M.R.A.O.U.

(Plate XIV.*)

JOHN BURROUGHS, the veteran naturalist of North America, in his 'Ways of Nature,' has the following remarks concerning birds and their use of string as a nesting material:—
 "Who ever saw any of our common birds display any sense or judgment in the handling of strings? Strings are a comparatively new thing with birds; they are not a natural product, and, as a matter of course, birds blunder in handling them. The Oriole (*Icterus galbula*) uses them the most successfully, *often attaching her pensile nest to the branch by their aid*. But she uses them in a blind, childish way, winding them round and round the branch, often getting them looped over a twig or hopelessly tangled, and now and then hanging herself with them, as is the case with other birds.

"I have seen a photograph of an Oriole's nest that had a string carried round a branch apparently a foot or more away, and then brought back and the end woven into the nest. It was given as a sample of a well-guyed nest, the discoverer no doubt looking upon it as proof of an Oriole's forethought in providing against winds and storms. I have

* For explanation of the plate see p. 422.